

Dow Corning PROPRIETARY

Remarks

The examiner objected to Claim 6 under 37 CFR 1.75(c) as improper form, because a multiple dependent claim can not depend on another multiple dependent claim. Claim 6 has been amended to remove the improper dependency to Claim 5.

Specification

The examiner noted that the application did not contain an abstract of the disclosure as required by 37 CFR 1.72(b). Therefore, an abstract is submitted herewith for inclusion in the application.

The examiner noted that the application as submitted was lacking a Brief Description of Drawings section. Therefore, the specification is presently amended to add such section.

Claim Rejections

The examiner rejected claims 1-6 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Haines et al (USPN 5,395,956). With respect to anticipation by Haines, the examiner argues that Haines teaches a process for preparing cyclic organohydrogensiloxanes that comprises contacting a silane, which is in accordance with the instant invention, with water to form a hydrolyzate. The hydrolyzate is diluted in an inert solvent and contacted with an acidic rearrangement catalyst to effect formation of cyclic organohydrogensiloxanes. The cyclic organohydrogensiloxanes are then separated from inert solvent and linear organohydrogensiloxanes. The inert solvent and linear organohydrogensiloxanes are then recycled to the process for the further contact with the acidic rearrangement catalyst.

The examiner also argues that Haines teaches that the acidic rearrangement catalyst can be a protic acid or a Lewis acid and that the acidic rearrangement catalyst can be a homogeneous catalyst such as hydrogen chloride, sulfuric acid, or chlorosulfonic acid or sulfonated divinylbenzenestyrene. From this, the examiner concludes that the instant invention is thereby anticipated by Haines. Applicant respectfully disagrees.

Page 6 of 11

Dow Corning PROPRIETARY

Nowhere does Haines disclose the Claim 1 limitation "characterized in that the acidic rearrangement catalyst is an organic compound containing a strong acid group which is dissolved in the inert diluent present" (Claim 1). In the process disclosed in Haines, the acidic rearrangement catalysts, namely hydrogen chloride, sulfuric acid, or chlorosulfonic acid or sulfonated divinylbenzenestyrene copolymer resin, are not dissolved in the inert diluent like in the present invention. On the contrary, the catalysts disclosed in Haines are employed as fixed- or stirred-beds. And, the catalysts disclosed for use in the process of Haines would not work in the process of the present invention because the catalysts of Haines are not dissolvable in the diluent to an appreciable extent. This distinction is important, because it is believed that the dissolving of the catalyst in the inert diluent provides, among other results, the unexpected results of greater cyclics yields. The importance of this difference is evident in Example 1, where the results for the process of the instant invention (% cyclics averaging above 5%) are compared with those of the process of Haines (% cyclics in the range of 1% to 3%). (See Example 1, paragraphs [0023] and [0024].) Therefore, the process of the present invention is not anticipated by the process of Haines.

With respect to obviousness, the examiner argues that Haines teaches a process for preparing cyclic organohydrogensiloxanes. The process comprises contacting a silane according to the present invention with water to form a hydrolyzate. The hydrolyzate is diluted in an inert solvent and contacted with an acidic rearrangement catalyst to effect formation of cyclic organohydrogensiloxanes. The cyclic organohydrogensiloxanes are then separated from inert solvent and linear organohydrogensiloxanes. The inert solvent and linear organohydrogensiloxanes are then recycled to the process for further contact with the acidic rearrangement catalyst.

The examiner further argues that Haines teaches that the acidic rearrangement catalysts useful in this process can be any acid which facilitates rearrangement of linear organohydrogensiloxanes to cyclic organohydrogensiloxanes. The acidic rearrangement catalyst can be a protic acid or a Lewis acid. The acidic rearrangement catalyst can be a homogeneous catalyst such as hydrogen chloride, sulfuric acid, or chlorosulfonic acid or sulfonated divinylbenzenestyrene.

Page 7 of 11

Dow Corning PROPRIETARY

The examiner then concludes that the difference between the instant claims and Haines is that the instant claims require that the sulfonic acid is dodecylbenzenesulfonic acid, wherein the concentration of the catalyst in the diluent is in the range of 0.05 to 5 % by weight. However, Haines teaches that any acid which facilitates rearrangement of linear organohydrogensiloxanes to cyclic organohydrogensiloxanes can be used, for instance sulfonic acid can be used and dodecylbenzenesulfonic acid is a specific type of a sulfonic acid. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ any sulfonic acid with a proper concentration effective to facilitate the rearrangement of linear organohydrogensiloxanes to cyclic organohydrogensiloxanes as suggested by Haines et al. We again respectfully disagree.

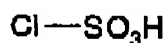
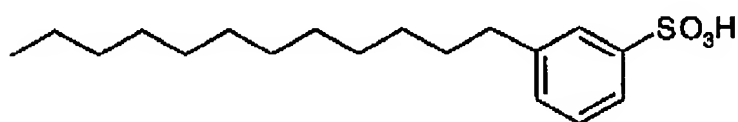
Claims 1-6 are not obvious over Haines because the added process limitation in Claim 1 of "the acidic rearrangement catalyst. . . is dissolved in the inert diluent present." The examiner did not fully appreciate the importance of this difference when ascertaining the differences between the prior art and the claims at issue. As discussed above for novelty, the acidic rearrangement catalysts of Haines, namely hydrogen chloride, sulfuric acid, or chlorosulfonic acid or sulfonated divinylbenzenestyrene copolymer resin, are not dissolved in the inert diluent like the catalysts in the present invention. On the contrary, the catalysts disclosed in Haines are employed as fixed- or stirred-beds and would not even work in the process of the present invention because they are not dissolved in the diluent. This is an important aspect of the present invention and provides the unexpected results of greater cyclic material yields, as is illustrated in Example 1 and discussed above for novelty. Therefore, the use of acid rearrangement catalysts that are dissolved in the inert diluent was not contemplated by Haines, would not work in the process of Haines, and are, therefore, not obvious over Haines.

Furthermore, with respect to the identity of the acid rearrangement catalysts, Haines' disclosure of the genus of any protic acid or Lewis acid is much too broad to effectively disclose the use of the acid rearrangement catalysts useful in the process of instant application. "Any protic acid or Lewis acid" essentially describes any known acid, and is too large of a genus to make the acid rearrangement catalysts of the present invention obvious. Not all protic acids and

Dow Corning PROPRIETARY

Lewis bases will be soluble in the inert diluent of the present invention, and, therefore, any acid would not work in the present invention.

Similarly, Haines disclosure of chlorosulfonic acid and sulfonated divinylbenzenestyrene copolymer is not the disclosure of the broader generic sub-genus of sulfonic acid as argued by the examiner. Chlorosulfonic acid and sulfonated divinylbenzenestyrene copolymer are disclosed in Haines to exemplify the genus of protic acid and not the sub-genus of sulfonic acids. And, even if the disclosure of chlorosulfonic acid is considered to disclose the large sub-genus of sulfonic acid, a comparison of the following structures of chlorosulfonic acid and dodecylbenzenesulfonic acid makes it clear that the size of the sulfonic acid genus is too large to make the use of all species of sulfonic acids and the present invention obvious:



Inspecting the two structures above, one would expect markedly different solubility between the two compounds. The molecules are similar only in that they have an SO_3H group; the rest of the molecules are completely different. Where chlorosulfonic acid has a chlorine, dodecylbenzenesulfonic acid has a large hydrocarbon group, which provides the solubility in the inert solvent important to the instant invention. A comparison with the structure and properties of the copolymer of sulfonated divinylbenzenestyrene copolymer with dodecylbenzenesulfonic acid yields a similar conclusion especially if the copolymer is cross-linked.

Therefore, Haines does not disclose the acid rearrangement catalyst "containing a strong acid group which is dissolved in the inert diluent present" of Claim 1 of the instant invention, and the genus of protic and Lewis acid is much too broad to make the acidic rearrangement catalyst of the present invention obvious. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed Cir. 1992). With

Dow Corning PROPRIETARY

respect to the specific species disclosed in Haines, their structures and solubility are such that they are not useful in the process of the present invention, and, therefore, they are insufficient to render the present invention obvious. This conclusion is made more compelling when considered in light of the unexpected results achieved with the acid rearrangement catalysts in the process of the instant invention compared to those with the process of Haines as described above.

Finally, prior art must be considered in its entirety, including disclosures that teach away from the claims MPEP §2145 (X)(D), MPEP §2143.01. The proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference MPEP §2145 (X)(D), MPEP §2143.01. A prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness MPEP §2145 (X)(D). The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness MPEP §2145 (X)(D).

Haines teaches away from using the catalysts of the present invention. In column 4, lines 11-13, Haines states the following:

However, such homogeneous acids are generally not preferred in the present process since they must subsequently be neutralized.

And, at column 4, lines 15-19, of Haines:

Preferred is a heterogeneous catalyst which can be used in the present process, for example, as a fixed-bed or stirred-bed. The present process can be run as a continuous, semi-continuous, or batch process. Preferred is when the present process is run as a continuous process using a fixed-bed of the acidic rearrangement catalyst.

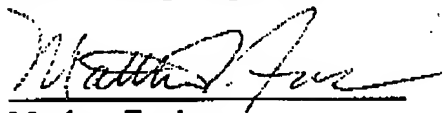
Clearly, Haines did not appreciate or intend to use homogeneous catalysts which are dissolved in the inert diluent as in the instant application. Therefore, the applicants request that

Dow Corning PROPRIETARY

the examiner reconsider the rejection in light of the arguments above and that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) be withdrawn and the claims allowed to issue.

This reply is being submitted within the period for response to the outstanding office action. Although the applicants believe in good faith that no extensions of time are needed, the applicants hereby petition for any necessary extensions of time. You are authorized to charge deposit account 04-1520 for any fees necessary to maintain the pendency of this application. You are authorized to make any additional copies of this sheet needed to accomplish the purposes provided for herein and to charge any fee for such copies to deposit account 04-1520.

Respectfully Submitted,
Dow Corning Corporation



Matthew Fewkes
Reg. No. 52,888
Tel: 989-496-5155